

# ECE 530 Cloud Computing

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Cyberinfrastructure

# High Performance Computing

- What is “high performance computing”?
  - The application of computer technology exceeding the capabilities of a desktop computer to solve problems that cannot be easily solved on a desktop computer.
- Includes the use of –
  - Supercomputers
  - Cluster Computers
  - Distributed Computing
  - Grid Computing
  - Exotic hardware
    - E.g. Field Programmable Gate Arrays (FPGA)

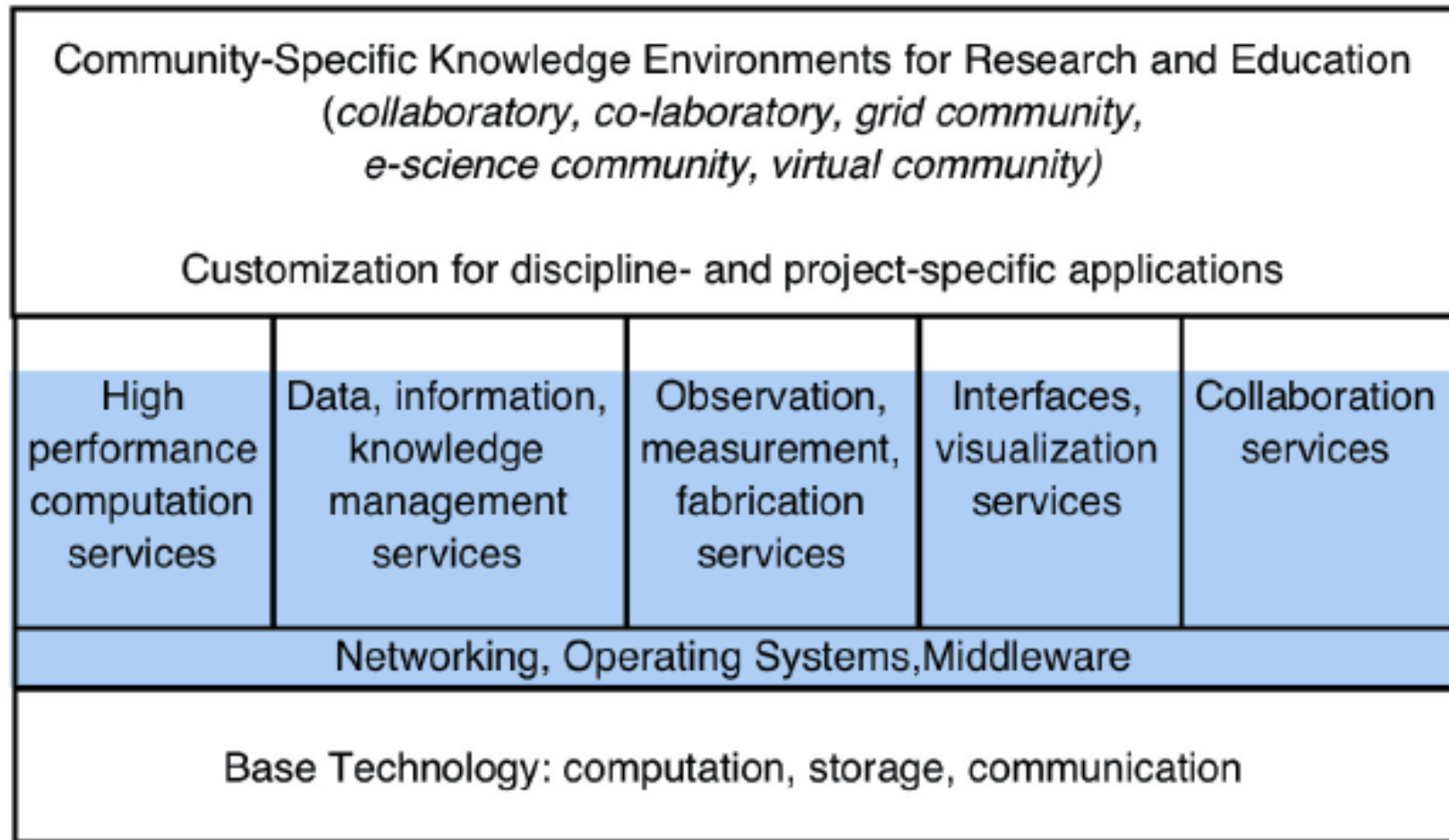
# Grid Computing


- Grid Computing
  - A high performance computing system built as a geographically distributed system from a collection of cluster computers, supercomputers, desktop computers, and storage systems, all connection via high speed networks.

# Cyberinfrastructure

- What is “cyberinfrastructure”?
  - An information technology framework for discovery and collaboration
- Comprised of a collection of –
  - ***Instruments and sensors***
  - High performance computing systems
  - ***Data storage systems***
  - Visualization facilities
  - ***All tied together by high speed networks.***

# NSF Atkins Report Cyberinfrastructure



 = cyberinfrastructure: hardware, software, services, personnel, organizations

# Solution: Outsource Data Center

- Can reap economies of scale
- Because of scale, can afford specialized skills
- Web developers can concentrate on their core competencies that give them market advantage
- Shorter lead times
- Lower capital requirements
- Computing power becomes a commodity, as did electric power in early 20<sup>th</sup> century